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SUBJECT: Translation of Article Dealing with Geographic Cartography in the Soviet Union

SUMMARY

The attachment is a translation of "Zur Organisation der geographischen Kartographie in der Sowjet Union" (The Organization of Geographic Cartography in the Soviet Union), an article by Dieter Bloch of Gotha which appeared in Petermanns Geographische Mitteilungen, No. 4, 1958. The article is a report made by a delegation of East German cartographers who visited the primary cartographic agency of the Soviet Union - Glavnoye upravleniye geodezii i kartografii - GUCK (Main Administration for Geodesy and Cartography) in Moscow.

The original article is somewhat confusing so a few remarks of clarification concerning organizational structure may prove helpful. Apparently the East German cartographers were only allowed to visit certain components of GUCK, namely those bodies under the Administration for Small Scale Cartography. Three main offices or institutes under this Administration are given as (1) the Scientific Editorial Office for Map Compilation, (2) the Central Scientific Research Institute for Geodesy, Aerial Photography, and Cartography (ZNIIGAIK), and (3) the Cartographic Factories. The Cartographic Factories are not discussed in the article but some of the research tanks of ZNIIGAIK are mentioned. Much of the report deals with the Scientific Editorial Office for Map Compilation and particularly its separate Editorial Offices and sub-sections.

Owing to the small amount of information available on GUCK, the translation should be of interest to US mapping agencies.

For the Ambassador:

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REPORTER

15 DEC 1959

The Organization of Geographic Cartography in the Soviet Union

In January 1958 the Ministry for Cultural Affairs of the DDR arranged for the visit of a technical delegation to the USSR. Two of the participants (one was the author) had the opportunity of obtaining detailed information on the organization of governmental mapping in the USSR.

The supervision of all cartographic works from planning to the delivery of maps, is delegated to GUGK (Glavnoje upravlenije geodezii i kartografii, Chief Administration for Geodesy and Cartography) which is attached to the Ministry for Interior of the USSR. GUGK supervises several administrations (of branches) for the various individual cartographic activities. For example, there is one administration in charge of producing small-scale maps which has a certain independent authority, but receives guidance from GUGK. In contrast to the situation in the DDR and the western countries, all cartographic organizations in the USSR, including those in Universities, are coordinated by this main office. GUGK assigns a "plan" to each institute and each factory for production of maps during the coming year. The purpose of this plan, which deals with topics as well as finances, is to prevent any overlapping in production.

For certain projects which are not selfsupporting, subsidies are paid (for example, Atlas Mira). One section of GUGK is called "Control of Geodesy and Cartography"; here the whole cartographic production is checked and licenses are issued. All larger projects, like Atlas Mira, Morskoy Atlas, highschool atlases, maps for encyclopedias, school maps, and historical maps are supervised by a scientific editorial board within GUGK. This board makes decisions on the methodological, political technical, and artistic problems and is also in charge of deciding financial questions.

The Administration for Small-Scale (geographic) Cartography supervises the several institutes for editorial works and also the cartographic factories. One of the institutes is the Central Scientific Research Institute for Geodesy, Aerial Photography and Cartography (ZNIIGAİK) with several sections. This institute is in charge of all scientific work on atlases and maps. In addition, it works on the solution of basic scientific problems. One of the sections of ZNIIGAİK is the "Office for Transcription". The main task of this office is the control of a standard transcription. There are three subdivisions, covering:

1. The territory of the USSR
2. Geographic Names of foreign countries
3. General transcription

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This office employs approximately 30 people, geographers and linguists. The work is carried out by means of a record card system which covers all existing geographic names by countries and languages. The standardized transcription is attempted by establishing rules for all languages with consideration of specialities, characteristics, reference books, etc.

In the USSR, the problem of transcription is of a more difficult nature than in those countries which use Latin alphabets. The work is coordinated with similar institutions at the universities, etc. Every two years there appears a place-name reference book on the Soviet Union.

It is of interest that maps and atlases for the area of the Baltic States are published using Latin alphabets. They are edited in Riga. Georgian maps are edited in Tbilisi (Tiflis).

Another section (of ZNIIGAIK) deals with projections and mathematical cartography. This work is carried out in two directions, one for theoretical-scientific aspects, the other one for the applied needs.

Suitable projections for cartographic representation have been developed and calculated for all parts of the world. Some of these projections were compiled and published in the "Atlas of Projections" by G.A. Ginsburg and T.D. Salmanova, Moscow, 1957. In addition, a bibliography of 300 titles dealing with mathematical geography was published. Important preparatory work is carried out in this section of ZNIIGAIK for the whole field of cartography with regard to projections. The selection of projections for all maps and the calculation and supply of coordinates to the mapping institutes is also carried out there.

The other sections of ZNIIGAIK, which regrettably could not be visited, are concerned with other scientific research tasks within cartography.

The actual cartographic work is carried out in the scientific editorial office for map compilation. This institute has the following sections:

1. Editorial Offices
2. Experimental Section
3. Design (Drawing)
4. Photography
5. Copying

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6. Retouching
7. Engraving
8. Proof Printing
9. Grinding

The actual printing is not carried out here, but in the cartographic factories, such as Minsk, Omsk, etc. The institute is headed by a director who is assisted by a technical and scientific editor. There are about 800 employees. The most important components of the institute are the editorial offices which are assigned tasks in their special fields. These offices have the following personnel: 1 main editor, 20 chief editors, 80 editors, about 300 compilers (technically trained cartographers). The editorial offices include the following sub-sections which are engaged in designing and compiling maps:

1. Documentation, library and map collection
2. Experimental branch
3. School maps
4. Atlases
5. Historical maps
6. Special maps and extra orders

The "Documentation" branch employs 31 people. It consists of the library and map collection plus the group which produces working sheets for the editorial offices. Among these duties, the maintenance of a record card system as well as a working (documentation) map of the world must be mentioned. Twenty people are engaged in abstracting news of interest to cartography from various sources. The working map for the USSR is at the scale of 1:1,000,000. For corrections, the symbols of the International Map of the World at 1:1,000,000 are applied. Europe is covered at the scale of 1:1,500,000 and the rest of the world at 1:2,500,000. These base maps are kept up-to-date and serve as basic records for the various editors. Another task of this office is to determine when a new issue of a map should be prepared. If so, it must be reported to the "Main Administration" in order to establish the further tasks necessary. All changes, including those of administration, occurring within the territory of the Soviet Union, are listed in a bi-weekly bulletin. Semiannually there appears also a compilation of these changes. Both publications are issued by the Ministry for the Interior of the USSR.

Another aid for the editor is a record card system listing population figures of all cities, arranged both by size and by country.

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Other aids consist of up-to-date maps of railways, waterways, etc. Catalogs for ports, air-ports, mineral resources (with date) and national parks simplify the editorial work considerably.

In the map collection, seven employees are responsible for the maintenance of approximately 100,000 foreign maps of recent dates. These maps are filed by continents and are arranged by a decimal classification; for example: I 04/05 whereby I stands for the continent and the numbers for the country and the topical classification (topographic, geological, etc.). All acquisitions are listed in a book and receive an additional number. A special fund is set up for acquisitions.

The library contains only working material. Items not in stock are borrowed from one of the larger libraries in Moscow. New acquisitions are circulated to the employees of the institute.

The four actual editorial sub-sections (of the editorial offices), one each for school maps, historical maps, atlases, and special subject maps, have a similar arrangement and use similar working methods. The main editor and main engineer assign the job to one of these offices after it has been issued by the Main Administration with details on title, scale, and dead-line requirement. One chief editor is in charge of establishing a detailed work schedule. If it is a routine job, he does this alone, but otherwise, specialists are consulted. For example, the editorial plan for the Atlas of the USSR (187 maps, 103 of them geographical) covers the following points:

1. General directions, goal and task
2. Size and type of binding
3. Content of atlas, types of maps, scales, etc.
4. Projection, density of grid
5. Geographic maps
 - a. Compilation of the map by cartographic elements
 - b. Map material
 - c. Transcription
6. Political-administrative maps of the SSR
7. Physical maps

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8. Social-economic maps (industrial branches)
9. Economic-regional maps
10. Legend covering geographic names
11. Technology of map compilation (editorial work), marginal design
12. Technology of map design (final drawing)
13. Colors to be used for printing

The editorial plan covers all details including the width of drawing lines for representing rivers, railroads, etc. The general nature of the area shown must be recognizable (for example swamp or forest distribution). The density of elevation points and selection of contour lines are determined. After this plan has been established, it is evaluated by the editor, chief editor, and main editor, respectively. After approval by the main administration the actual cartographic work is started.

The sheet corners of a map are indicated on mounted drawing medium of heavy paper ("kaschierter Zeichenkarton") and then the coordinates of the gridlines are defined by the application of coordinatographs. Neatlines and gridlines are then fully drawn. The source map is then reduced to the new scale and blue copies are produced on "Whatmans" paper. By compiling the individual parts of the map and mounting them on the grid, which is thereby used for checking accurate locations, the cartographer obtains the new base map for his work. Now all lines are drawn on to the base map in accordance with the legend. After checking by the editor and a special "correction brigade" which is attached to each editorial section, the enlargement to the drafting scale is carried out. The proportion of the enlargement depends upon the nature of the job. After the line elements are drawn, a proof-print is produced. It serves for the establishment of the color samples for the engravers ("Graveurs"-Draftsmen) and as a sample pattern in original color for the proof print. After the finishing of the proof prints, the permission for the final print is obtained from the Main Administration.

The editorial office for school maps handles the whole program for geography teaching in the schools of the USSR. School atlases are designed for each course of basic and middle-schools where geography is taught, i.e. 4th to 10th grade. In early 1958, three such atlases were completed. They are published in a very large issue (up to one million copies) and are sold cheaply 0.75 to 2.30 Rubles.

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The issue of wall maps is also very high. Therefore it can be arranged that special editions are produced for both elementary and for schools at university level. In the editorial office for atlases, "Atlas Mira" and the "Morskoy Atlas", part I and II were produced. At present, part III of the latter atlas which deals mostly with historical subjects, is in work. The project of an Agricultural Atlas of the USSR has been submitted for approval. An Atlas of China will incorporate 113 sheets at various scales. One sheet of the area of the lower Yangtze River at 1:750,000 was in work. A Soviet map at 1:200,000 of this area served as a base map.

The editorial office for historical maps handles the program for history teaching aids. There are historical atlases and wall maps for each course. In this program seven historical atlases were produced: "History of Antiquity", "History of the USSR" (3 volumes), "New History" (2 volumes), and "Middle Ages". Among the historical wall maps produced, seven were for the basic schools, 55 were for high schools and 14 were for universities. In order to produce better comprehension, atlases and maps are accompanied by pictures. There is an editorial board composed of methodologists and cartographers for each such item published. In addition to the school maps, maps for the encyclopedias are prepared. An atlas for the universities with the title "Geographic Discoveries and Research", covering the period from prehistoric times to 1917, was created in this section. This atlas has 92 pages. All of the editors have a special training in history.

The editorial office for special maps is engaged in various other projects, e.g., production of maps for the Small Soviet Encyclopedia, the Political World Atlas (probable publication - 1959), and area or tourist maps. Among the tourist maps, there are two types: the standard hiking and vicinity map at scales of 1:300,000 - 1:600,000 and the panorama maps. One of the latter types which has been finished, shows the Caucasus in four colors. Topographic maps are, of course, the base for tourist maps. Attractive hiking areas and monuments are described on the reverse sides of the maps. The maps are checked and revised by local authorities. Another task is the production of "Handkarten" (general maps) of foreign areas which are sent to those countries for checking. Finally, the very important experimental editorial office must be mentioned. There are 19 artists and engineers engaged in designing the artistic parts of the maps. Their tasks are very different: design of the legend, marginal areas, and similar features. A very important project is that of relief representation. This is carried out by shading on "Whatmans" paper by means of brush and water colors. Light and shade are shown on one plate, the flat

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areas are tinted. By means of hand-retouching, the work is then improved on the screened film which shows the relief. The design is partly carried out by the application through filters of two colors, one each for lower and higher parts of the relief. Another task is the handcoloring of proof-prints for the design of the final prints. In addition advertising articles, for example, book markers with offers of maps and samples of original lettering script are also produced. For this latter purpose, letters are drawn at the size of 48 mm on paper. A mounted copy (reproduction) at 24 mm is again reduced to 8 mm. Copies are then produced on celluloid (in negative) which serve as material for lettering. The words are photographed at the desired size (reduced or enlarged) and copies are made on two-layers paper; the upper layer on which the drawings are indicated, can be cut out and mounted on "Whatmans" paper by using polyvinylalcohol. There are about 80 different scripts in use which can be chosen from a script-sample book. Tests are carried out on relief-shading with pencil on "Vinipros" (similar to astralon) and later reproduction by using contact screens. According to the opinion of the Soviet experts, this technique is not complicated, but the material is not yet adequate, since "Vinipros" has certain disadvantages.

Painters and graphic art specialists are engaged in special tasks, such as drafts of map titles, covers for books and maps, illustrations, etc.

In the design section, only female employees are employed. Generally it can be said that the number of male employees in the entire institute is relatively small compared to the situation in Germany. The proportion here is one man to two women. In this section, the drawing originals are produced. As mentioned above, this is done on "Whatmans" paper on the basis of enlarged blue copies. Rivers, cultural features, and contours are drawn by a type of curve-drawing pen. In most cases, all colors are drawn on one sheet and later separated by hand-retouching. This seems to be the best way to avoid registry difficulties as no medium is available with sufficient stability.

In a very generously equipped laboratory, all chemical solutions are made for copying use, etc. In addition, research is carried out on technological improvements. Engraving on coated glass or "Vinipros" is still in the process of experimentation. Satisfactory results can be obtained, but the necessary standard requirements have not yet been reached. Photography and proof printing are normal and there is nothing which can be reported as new. Machines, cameras, and reproduction equipment are of German origin and much praised. Except for the chief editor, the entire work of the institute is based on varying standards. In the editorial sections working hours are fixed

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and paid on this basis. If, for example, 120 hours are estimated to be necessary for a task, this is the amount paid for, regardless of actual time worked. The calculation is done by employees of each section, on the basis of "Norm-catalogs", which give types and difficulties of various tasks. This is a rather complicated procedure, but it appears that on the basis of long experience, a fair "Norm" system has been developed. The basis for each payment is the basic salary, which varies between 1,500 Rubles (editors), and 500 Rubles (draftsmen). For workers of the technical sections, such as photography, copying, and proof-printing, the wage is based on the number of items produced and the degree of difficulty. The average salaries of photographers and proof-printers is 1,500 Rubles and for copy workers 1,300 Rubles; the basic salaries of these workers are 833 and 750 Rubles respectively. The average leave period is approximately one week longer than for similar workers in the DDR. Pensions are paid on males at the age of 60 and females at 55. The pension range between 300 and 1,200 Rubles.

The training is similar to that in Germany. Editors and cartographers are trained in one of the two special schools for geodesy, cartography and photogrammetry in Moscow and Novosibirsk; the technical staff, i.e., draftsmen, copy-people and printers undergo practical training in individual institutes or cartographic factories. The theoretical training is carried out at a professional school. The students who have finished their cartographic training at the geographic faculties also have the possibility of entering a career as a map editor.

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